

Abstract

There is provided a semiconductor device having a high breakdown voltage and a high reliability in which a gate insulating film having a film thickness of good uniformity is formed inside a trench. An HTO is formed on an inner wall of a trench in an Si substrate by a reduced pressure CVD method and, thereafter, a thermally oxidized film is formed on an interface between the HTO and the Si substrate by performing a thermal oxidation treatment (Samples A and C). By performing these procedures as described above, the gate insulating film in which local thinning of the film is suppressed, film thickness is of good uniformity and an interface state density is low can be formed inside the trench. A semiconductor device, which has a trench gate structure, of a high quality and a high reliability having no reduction in the breakdown voltage in which a lifetime comes to be substantially longer compared with that (Sample B) in which the gate insulating film is formed only with a thermally oxidized film can be realized.